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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,755	03/25/2004	Yoshifumi Kato	5000-5154	7337

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EXAMINER	
PERRY, ANTHONY T	
ART UNIT	**PAPER NUMBER**
2879	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/809,755	Applicant(s) KATO ET AL.	
	Examiner Anthony T. Perry	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 25 March 2004.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,2 and 7-21 is/are rejected.

7)☒ Claim(s) 3-6,8 and 11-17 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 25 March 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3/25/04,3/31,4/25.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 3-6, 8, and 11-17 are objected to because of the following informalities:

In claim 3, lines 4-6, include the recitation, "the organic electroluminescent element includes an electrode shared with the heat absorbing electrode." The recitation is unclear because the Applicant is claiming two separate electrodes (the heat absorbing electrode and an electrode of the organic EL device). The Examiner recognizes from the specification and the drawings that what is meant is that the heat absorbing electrode of the Peltier element is also the cathode or anode of the organic EL element. The examiner suggests replacing "the organic electroluminescent element includes an electrode shared with the heat absorbing electrode or electrically connected to the heat absorbing electrode" with --the heat absorbing electrode of the Peltier element also serves as an electrode of the organic electroluminescent element or is electrically connected to an electrode of the organic electroluminescent element--.

Similar changes should be made in claim 4.

In claim 8, line 6, replace "element" with --layer--.

In claim 11, line 8, replace "exists" with --exits--.

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 7, 8, 10-15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al. (US 6,607,277) in view of Iwata et al. (US 5,724,818).

Regarding claims 1-2, 8, and 10, Yokoyama et al. disclose a LCD comprising a liquid crystal panel (12R,12G,12B) and an organic electroluminescent device comprising a Peltier element (14R,14G,14B), an electroluminescent layer (22), a cathode (23), and an anode (21), wherein the cathode (23) and anode (21) sandwiching the electroluminescent layer (22), with a voltage applied to the cathode and the anode to emit light from the entire organic electroluminescent layer (see Figs. 1 and 2). The organic electroluminescent element functions as a backlight for the liquid crystal panel. Yokoyama et al. do not specifically describe the structure of the Peltier element.

Iwata et al. disclose a device in figure 1 comprising: a semiconductor substrate (23), wherein the semiconductor substrate (23) entirely forms the Peltier element including a heat absorbing portion (B) at one side of the semiconductor substrate (23) and a heat radiating portion (A) at the opposite side; and a device (18) to be cooled arranged on the same side of the semiconductor substrate as the heat absorbing portion (B) (see Fig. 1). Iwata teaches that conventional Peltier elements have insulating substrates on sandwiching the device wherein the heat absorbed and radiated must travel through the respective substrates (see for example Fig. 5). The Peltier element taught by Iwata provides an improved cooling structure since the heat absorbing electrode is in direct contact with the electronic device (an organic electroluminescent device in the combined invention) to be cooled. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the Peltier element taught by Iwata et al. as the Peltier device in the display device of Yokoyama since it provides a highly efficient cooling device that is simple to manufacture and relatively inexpensive. The Examiner

notes that in the combined invention the organic electroluminescence element is arranged so that heat resistance between the organic electroluminescence element and the heat absorbing portion is less than heat resistance between the organic electroluminescence element and the heat radiating portion and the light emitted exits a side facing away from the semiconductor substrate.

Regarding claim 7, Iwata teaches the Peltier element including a p-type semiconductor (P) and an n-type semiconductor (N) arranged thermally in parallel to each other between two insulators (14 and 10) having high thermal conductivity, wherein the two semiconductors are electrically connected in series by an electrode (15) (see Fig. 1).

Reason for combination given in the rejection of claim 1, above, applies.

Regarding claims 11 and 17,Yokoyama et al. disclose a LCD comprising a liquid crystal panel (12R,12G,12B) an organic electroluminescent device (LT) having a Peltier element (14R,14G,14B) (see Figs. 1 and 2). The organic electroluminescent element functions as a backlight for the liquid crystal panel. Yokoyama et al. do not specifically describe the structure of the Peltier element.

Iwata et al. disclose a device in figure 1 comprising: a substrate (1) which makes up a Peltier device including a semiconductor region (23), a heat radiating electrode (11), and a heat absorbing electrode (15). Iwata teaches an electronic device (18) to be cooled arranged on the heat absorbing electrode (15) (see Fig. 1). Iwata teaches that conventional Peltier elements have insulating substrates (53 and 55) on each side of the device wherein the heat absorbed and radiated must travel through the respective substrates (see for example Fig. 5). The Peltier element taught by Iwata provides an improved cooling structure since the heat absorbing electrode is in direct contact with the electronic device (an organic electroluminescent device in the combined invention) to be cooled. Accordingly, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to use the Peltier element taught by Iwata et al. as the Peltier device in the display device of Yokoyama since it provides a highly efficient cooling device that is simple to manufacture and relatively inexpensive.

Regarding claims 12-13, Yokoyama teaches an insulating layer (25) made of silicon grease, which has a very high thermal conductivity, being formed on the absorption side of the Peltier element (26) connecting the organic electroluminescent device (LT) to the Peltier element (see Fig. 3). Accordingly, in the combined invention, an insulating layer of silicon grease is formed on the heat absorbing electrode, and the organic EL device is formed on the insulating layer. Silicon grease has a higher thermal conductivity than the Peltier substrate taught by Iwata.

Reason for combination given in the rejection of claim 11, above, applies.

Regarding claim 14, the substrate (1) taught by Iwata includes insulating parts (14 and 10). It is noted that the Applicant's specific property of the substrate being transparent, does not solve any of the stated problems or yield any unexpected result that is not within the scope of the teachings applied. The Applicant has already claimed that the light is emitted in a direction facing away from the substrate. It is noted that since the light of the organic EL device is not emitted through the substrate it is not required that the substrate be transparent, as such, it is considered to be a matter of choice, which a person of ordinary skill in the art would have found obvious to select any type of substrate (transparent or opaque). Furthermore, Iwata teaches the insulating members (14 and 10) being made of polymide resin, which is inherently transparent to a degree.

Reason for combination given in the rejection of claim 11, above, applies.

Regarding claim 15, Iwata teaches that the substrate (1) includes parts (15 and 11) made of metal.

Claims 1, 9, 11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (US 2002/0149312) in view of Iwata et al. (US 5,724,818).

Regarding claims 1, 9, 11, and 16, Roberts et al. teaches an organic electroluminescent device comprising a plurality of organic electroluminescent elements, wherein the OLEDs have discreet connections so that they can emit light independently from one another (see for example, paragraphs 0052 and 0069). Roberts et al. further teach the use of a Peltier substrate ((33) in Fig. 3B) with the device for dissipated heat generated from the device (see for example, paragraph 0065). Roberts teaches that the light emitted from the OLEDs exits a side facing away from the Peltier substrate. Roberts et al. do not specifically describe the structure of the Peltier element.

Iwata et al. disclose a device in figure 1 comprising: a semiconductor substrate (23), wherein the semiconductor substrate (23) forms the Peltier element including a heat absorbing portion (B) at the junction of the semiconductor substrate (23) and a heat absorbing electrode (15) and a heat radiating portion (A) at the junction of the semiconductor substrate (23) and a heat radiating electrode (11); and a device (18) to be cooled arranged on the same side of the semiconductor substrate as the heat absorbing portion (B) (see Fig. 1). Iwata teaches that conventional Peltier elements have insulating substrates on sandwiching the device wherein the heat absorbed and radiated must travel through the respective substrates (see for example Fig. 5). The Peltier substrate taught by Iwata provides an improved cooling structure since the heat absorbing electrode is in direct contact with the electronic device (an organic electroluminescent device in the combined invention) to be cooled. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the Peltier element taught by Iwata et al. as the Peltier substrate in the display device of Roberts since it provides a highly efficient cooling device that is simple to manufacture and relatively inexpensive. The Examiner

notes that in the combined invention the organic electroluminescence element is arranged so that heat resistance between the organic electroluminescence element and the heat absorbing portion is less than heat resistance between the organic electroluminescence element and the heat radiating portion and the light emitted exits a side facing away from the substrate.

Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 2002/0180658 A1) in view of Alonso (US 6,067,802).

Regarding claims 18-20, Saito et al. disclose an organic EL device that includes a plurality of organic EL elements that emit light independently from one another so that the device is capable of producing a moving image (see paragraph 0031). Saito et al. fails to teach a Peltier element used in organic EL device.

However, it is well known in the art to use Peltier elements in organic EL devices in order to dissipate heat from the device providing the device with a longer lifetime. Commonly Peltier elements are formed on the rear (non light emitting side) of the EL devices. However, the organic EL device taught by Saito et al. is a double-sided display (emits light from both sides). Alonso teaches a Peltier element that comprises a transparent insulating substrate comprising a region of thermoelements (synonymous in the art with blocks of thermoelectric semiconductor material) (3) and includes a heat absorbing portion on one side of the substrate and a heat radiating portion on the other side of the substrate such that heat flows from one side to the other (see for example, Fig. 1, col. 2, lines 52-65 and col. 3, lines 12-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the transparent Peltier element taught by Alonso with the organic EL device taught by Saito so as to provide a cooling means for the device while not inhibiting the display image on either side of the organ EL device. In the combined invention one of ordinary skill in the art would have obviously provided

the organic EL device on the heat absorbing side of the Peltier substrate so that heat can be dissipated away from the device. Naturally, the organic EL device of the combined invention is arranged on the substrate so that the heat resistance between the organic EL element and the heat absorbing portion is less than the heat resistance between the organic EL element and the heat radiating portion.

Regarding claim 21, organic EL device used as backlights for liquid crystal displays is well known in the art. Double-sided backlights are also well known in the art, as are there use in double-sided liquid crystal displays (having a liquid crystal panel each side of the backlight). One of ordinary skill in the art would have been motivated to used the Peltier element substrate in the same manner and for the same reasons as explained in the rejection of claims 18-20, above, in such a device.

Allowable Subject Matter

Claims 3-6 are objected to as being dependent upon a rejected base claim, but would be allowable if the objections noted in the "Claim Objections" section are addressed and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art fails to disclose or fairly suggest:

- An organic EL device including a Peltier element wherein the heat absorbing electrode of the Peltier element also serves as one of the electrodes of the organic electroluminescent element or is electrically connected to an electrode of the organic electroluminescent element, in combination with the remaining claimed limitations as called for in claim 3 (claims 4-6 would be allowable for the same reasons since they are dependent on claim 3).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Anthony Perry* whose telephone number is **(571) 272-2459**. The examiner can normally be reached between the hours of 9:00AM to 5:30PM Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-24597. **The fax phone number for this Group is (571) 273-8300.**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit 2879
April 28, 2006

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